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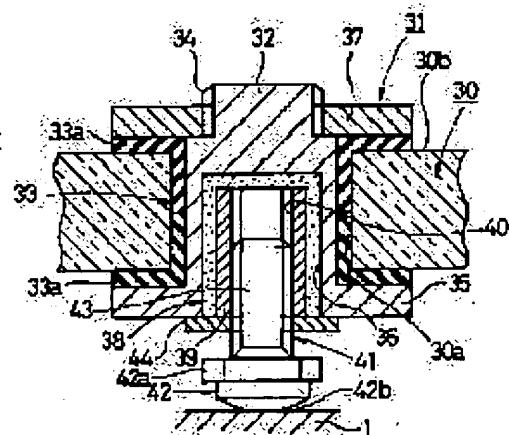
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(22) Date of filing : 02.04.1997 (72) Inventor : KATOGI TSUTOMU

**(54) ORIGINAL READER FOR ELECTRONIC COPYING MACHINE****(57) Abstract:**

**PROBLEM TO BE SOLVED:** To provide an original reader for an electronic copying machine, in which parallel and height alignment of an original platen glass is easily conducted.

**SOLUTION:** This original reader is provided with a height adjustment device 31 for adjusting the height of an original platen glass 30 fixed to a device main body frame 1, with respect to the device main body frame 1, a through-hole 30a is formed on the original platen glass 30, the height adjustment device 31 is made up of an insert fix thread 39 inserted and fixed to the through-hole 30a and a height adjustment bolt 41 screed to the insertion fixed thread 39.

**LEGAL STATUS**

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[Date of registration]

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decision of rejection]

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decision of rejection]

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**CLAIMS****[Claim(s)]**

[Claim 1] It is the manuscript reader of the electronic copying machine which the height adjustment device over said body frame of equipment of the manuscript base glass fixed to the body frame of equipment is established, and a breakthrough is formed in said manuscript base glass, and is constituted with the height adjustment bolt with which said height adjustment device was screwed in said breakthrough by the insertion fixed screw and this insertion fixed screw by which insertion immobilization was carried out.

[Claim 2] the sleeve which has elasticity is infixed in said breakthrough, and this sleeve contacts the ends to both sides of said manuscript base glass -- annular -- a collar -- having -- said insertion fixed screw -- said collar -- the manuscript reader of the electronic copying machine according to claim 1 currently fixed to the with sleeve.

[Claim 3] The manuscript reader of the electronic copying machine according to claim 1 with which it takes out in the manuscript base glass height of location \*\*\*\*\* to the light-receiving side of the body side of said manuscript base glass, and a fixture member attends the side edge of this manuscript base glass, and is prepared in said body frame of equipment.

[Claim 4] The manuscript reader of the electronic copying machine according to claim 1 characterized by static electricity which the destaticization film was formed at least in one side of both sides of said manuscript base glass, and was charged on said manuscript base glass being removed by said body frame of equipment via the height adjustment bolt screwed in said insertion fixed screw and this insertion fixed screw.

[Claim 5] It is the manuscript reader of the electronic copying machine according to claim 1 said whose sleeve and said bulking agent the sleeve which has elasticity is infixed in said breakthrough, said insertion fixed screw is fixed to said breakthrough through a bulking agent, and are conductivity.

[Claim 6] The manuscript reader of the electronic copying machine according to claim 1 which is the thing of the automatic feeding type with which said electric copying machine turns and carries out automatic feeding of the manuscript to said manuscript base glass.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

#### [0001]

[Field of the Invention] This invention relates to amelioration of the manuscript reader of an electronic copying machine.

#### [0002]

[Description of the Prior Art] As there are a thing of an analog type and a thing of a digital type in an electronic copying machine and it is typically shown in the thing of an analog type from the former at drawing 1, manuscript base glass 2 is formed in the upper part of the body frame 1 of equipment. Manuscript base glass 2 is supported by the spherical height 3 which protruded on the body frame 1 of equipment at one. the light-receiving side of the photo conductor rotating drum 3 which mentions the spherical height 3 later with body side 2a of manuscript base glass 2 -- parallel appearance is carried out and the role of height \*\*\* is played. The optical scanner 4, mirrors 5 and 6, a lens 7, a mirror 8, the photo conductor rotating drum 3, electrification / development unit 10, and anchorage device 11 grade are prepared in the interior of the body frame 1 of equipment, a sheet paper cassette 12 is formed in the lower part by one flank of the body frame 1 of equipment, and the blowdown section 13 is formed in the lower part by the other flanks of the body frame 1 of equipment. The optical scanner 4 consists of lamp 4a and mirror 4b, and the optical scanner 4 is scanned in the direction of an arrow head. The reflected light reflected from the manuscript (a graphic display is omitted) with which slit exposure was carried out and manuscript base glass 2 was set to manuscript base glass 2 by this Mirror 4b, It is led to light-receiving side 3a of the photo conductor rotating drum 3 by 5, 6, the lens 7, and the mirror 8, and an electrostatic latent image is formed in light-receiving side 3a of the photo conductor rotating drum 3.

[0003] The electrostatic latent image formed in light-receiving side 3a of the photo conductor rotating drum 3 is formed into a visible image as a toner image with electrification / development unit 10, and the toner image which the copying paper was conveyed from the sheet paper cassette 12 to predetermined timing on the other hand, and was formed in the photo conductor rotating drum 3 at the copying paper is imprinted, it is fixed to it by the anchorage device 11, and the copying paper with which the image information of a manuscript was copied from the blowdown section 13 is discharged.

[0004] Drawing 2 is the mimetic diagram showing the optical physical relationship of body side 2a of the manuscript base glass 2, a lens 7, and light-receiving side 3a of the photo conductor drum 9. What is necessary is just to arrange a lens 7 so that the distance a from the principal point H of a lens 7 to body side 2a may satisfy (1) type and the distance b from principal point H' of a lens 7 to light-receiving side 3a may satisfy (2) types in order to carry out image formation of the focal distance of a lens 7 to light-receiving side 3a for f and a scale factor m.

$$a = (1 + 1/m) f \quad (1)$$

$$b = (1 + m) f \quad (2)$$

In addition, in drawing 2, Sign F and F' show the principal point H and the focal location from H'.

[0005] In order to call conjugation length the distance from the body side 2a to light-receiving side 3a, to maintain a scale factor with conjugation length and to make light-receiving side 3a spread the line

information by slit exposure of body side 2a to parallel Arrange a criteria chart in light-receiving side 3a, and the image of a criteria chart is projected on body side 2a through a lens 7. The reverse resolution decipherment activity (focus appearance is carried out and it works) of deciphering the image of a criteria chart is done by body side 2a. When the information on the scanning direction which image formation of the line information on body side 2a is not spread and carried out to parallel at light-receiving side 3a, and intersects perpendicularly with the line information maintains the same optical path and image formation is not carried out Body side 2a of manuscript base glass 2 and light-receiving side 3a are parallel, and slope regulation of each mirrors 5, 6, and 8 and positioning of a lens 7 are performed so that conjugation length may become within the limits of an optical design value. In addition, in giving a variable power function to a copying machine, in accordance with a projection optical path, it is made to move slightly or is moving each mirrors 5, 6, and 8 for the lens 7 in accordance with a projection optical path. Moreover, when there is modification of the thickness of manuscript base glass 2, adjustment of this conjugation length is needed.

[0006] As shown in drawing 3, the profile configuration of the electronic digital-type copying machine is carried out from the reader section 14 and the printer section 15. Manuscript base glass 2, the spherical height 3, the optical scanner 4, mirrors 5 and 6, and a lens 7 are formed in the reader section 14 like the thing of an analog type, and image formation of the image information of the manuscript set to manuscript base glass 2 is carried out to CCD16 as a light-receiving side with the optical scanner 4, mirrors 5 and 6, and a lens 7, it is changed into a photo-electric-translation signal, and is processed by the image-processing section 17. The write-in optical system 18, the same mirror 19 as the thing of an analog type, the photo conductor rotating drum 3, electrification / development unit 10, and anchorage device 11 grade are prepared in the printer section 15, and, as for the write-in optical system 18, image information is written in light-receiving side 3a of the photo conductor rotating drum 3 according to the processing information on the image-processing section 17. The copying paper with which the image information written in light-receiving side 3a of the photo conductor rotating drum 3 was copied to the copying paper, and the image information of a manuscript was copied from the blowdown section 13 is discharged.

[0007] As shown in a detail, L typeface member 19 for positioning manuscript base glass 2 is fixed to drawing 4 by the conclusion member 20 by the upper part of the body frame 1 of equipment. Lay manuscript base glass 2 in the spherical height 3, and the height adjustment ring 21 and the manuscript base glass-stop member 22 are arranged in the body frame 1 of equipment. Manuscript base glass 2 is fixed to the top face of the body frame 1 of equipment by fixing the height adjustment ring 21 and the manuscript base glass-stop member 22 to the body frame 1 of equipment using the conclusion member 23.

[0008]

[Problem(s) to be Solved by the Invention] However, in order to set height \*\*\*\* and parallel \*\*\*\*\* of manuscript base glass 2 as a precision, the copying machine of the conventional electronic formula the spherical height 3 -- precision -- since it had to create highly and the slope regulation of mirrors 5, 6, and 8 and positioning of a lens 7 were moreover performing tuning of height \*\*\* of manuscript base glass 2, and parallel \*\*\*\*\* , tuning takes time amount and there is a trouble that cost becomes high.

Moreover, the thickness of manuscript base glass 2 may be changed and it divides, and manuscript base glass 2 tends to be thin-shape-sized generally, in this case, between manuscript base glass 2 and the spherical height 3, it must insert a spacer, and must perform height adjustment and cost increases it by the current update like an erector etc. In addition, since it is supported by manuscript base glass 2 at the contact section with the spherical height 3, when impulse force joins manuscript base glass 2, possibility that a concentrated load will join the contact section and manuscript base glass 2 will break is large.

[0009] In addition, although that to which manuscript base glass 2 adjusted the height of manuscript base glass 2 itself to the thing of a sliding type is known for the manuscript reader of an electronic copying machine (refer to JP,63-334,U), in this thing, it is difficult to perform entire height \*\*\* and entire parallel \*\*\*\*\* of manuscript base glass 2.

[0010] Next, although there is a thing equipped with the manuscript automatic feeding equipment which

turns and carries out automatic feeding of the manuscript to manuscript base glass in an electronic copying machine In order to remove static electricity generated in this thing when a manuscript slides on manuscript base glass The film of conductive material is formed with means, such as plating and vacuum evaporationo, each side of manuscript base glass 2, or he sticks a metal plate each of that side, and is trying to discharge static electricity generated on manuscript base glass 2 through an earth wire (refer to JP,60-191042,U). However, when it is fixing this earth wire to the body frame of equipment with adhesives, taping, soldering, etc., it separates by the mechanical oscillation at the time of actuation of an electronic copying machine, and there is a possibility that the float by exfoliation by the mechanical shock and secular change may be generated. Moreover, in order to remove static electricity generated on this manuscript base glass 2, the transparency electric conduction film is formed in the front face of manuscript base glass 2. Although there is also a thing of a configuration of contacting a conductive cushion member on this transparency electric conduction film, and discharging electricity through a conductive member and an earth wire (refer to JP,62-182735,A) This thing as well as JP,60-191042,U separates by the mechanical oscillation at the time of actuation of an electronic copying machine, and has a possibility that the float by exfoliation by the mechanical shock and secular change may be generated. Furthermore, although the thing of a configuration of forming the transparency electric conduction film in manuscript base glass 2, and forcing and grounding a conductive member to the side edge side of manuscript base glass 2 is also known in order to remove static electricity generated on this manuscript base glass 2 (refer to JP,62-164339,U), it separates by the mechanical oscillation at the time of actuation of an electronic copying machine also in this thing, and there is a possibility that the float by exfoliation by the mechanical shock and secular change may be generated.

[0011] the manuscript reader of the electronic copying machine which can adjust easily by having succeeded in this invention in view of the above-mentioned situation, and manuscript base glass's carrying out parallel appearance of the 1st object, and carrying out height appearance is offered. the 2nd object offers the manuscript reader of the electronic copying machine which can discharge certainly static electricity which the manuscript base glass carried out parallel appearance, and carried out height appearance, and which was generated on manuscript base glass using the device of adjustment.

[0012]

[Means for Solving the Problem] The height adjustment device over said body frame of equipment of the manuscript base glass with which the manuscript reader of the electronic copying machine of this invention according to claim 1 is fixed to the body frame of equipment is established, a breakthrough is formed in said manuscript base glass, and said height adjustment device is constituted by the height adjustment bolt screwed in said breakthrough by the insertion fixed screw and this insertion fixed screw by which insertion immobilization was carried out. the sleeve to which the manuscript reader of the electronic copying machine of this invention according to claim 2 has elasticity in said breakthrough in a thing according to claim 1 is infixed, and this sleeve contacts the ends to both sides of said manuscript base glass -- annular -- a collar -- having -- said insertion fixed screw -- said collar -- it is fixed to the with sleeve. The manuscript reader of the electronic copying machine of this invention according to claim 3 is taken out to said body frame of equipment in a thing according to claim 1 in the manuscript base glass height of location \*\*\*\*\* to the light-receiving side of the body side of said manuscript base glass, a fixture member faces it the side edge of this manuscript base glass, and it is prepared. As for the manuscript reader of the electronic copying machine of this invention according to claim 4, the destaticization film is formed at least in one side of both sides of said manuscript base glass in a thing according to claim 1, and static electricity charged on said manuscript base glass is removed by said body frame of equipment via the height adjustment bolt screwed in said insertion fixed screw and this insertion fixed screw. The sleeve to which the manuscript reader of the electronic copying machine of this invention according to claim 5 has elasticity in said breakthrough in a thing according to claim 1 is infixed, said insertion fixed screw is fixed to said breakthrough through a bulking agent, and said sleeve and said bulking agent are conductivity. The manuscript reader of the electronic copying machine of this invention according to claim 6 is the thing of the automatic feeding type with which said electric copying machine turns and carries out automatic feeding of the manuscript to said manuscript base glass

in a thing according to claim 1.

[0013]

[Embodiment of the Invention] The gestalt of operation of the manuscript reader of the electronic copying machine concerning this invention is explained to it, referring to a drawing to below. Drawing 5 shows the perspective view of the manuscript base glass 30 concerning this invention, this manuscript base glass 30 has three breakthrough 30a, two of the breakthroughs 30a and 30a of it are arranged in the corner of one short side part of that manuscript base glass 30, and other one breakthrough 30a is arranged in the center of the short side part of another side. As shown in drawing 6, the height adjustment device 31 is formed in breakthrough 30a.

[0014] This height adjustment device 31 has a holddown member 32. This holddown member 32 is inserted in breakthrough 30a through the sleeve 33 which consists of a charge of rubber lumber. This sleeve 33 is considered as a up Shimowake rate configuration, and flange 33a is formed in the head of a sleeve 33. The male screw section 34 is formed in the crowning of a holddown member 32, and the flange 35 is formed in the lower part of a holddown member 32. The hollow 36 is formed in the holddown member 32. The holddown member 32 is fixed to manuscript base glass 30 by making a nut 37 screw in the male screw section 34. A sleeve 33 is fixed to manuscript base glass 30 by the nut 37 and flange 35.

[0015] The gummous packing material 38 is arranged in the hollow 36 of a holddown member 32, and the insertion screw 39 as an insertion fixed screw is being fixed to the hollow 36 with this gummous packing material 38. A female screw 40 is formed in the insertion screw 39, and the height adjustment bolt 41 is screwed in this insertion screw 39. Hexagon-like tool engagement section 42a and spherical section 42b are prepared in the head 42 of the height adjustment bolt 41. The nut 44 is screwed in the screw section 43 of the height adjustment bolt 41.

[0016] It is in contact with spherical section 42b of the height adjustment bolt 41 on the top face of the body frame 1 of equipment. the height adjustment device 31 -- using -- the height appearance of manuscript base glass 30 -- carrying out -- and parallel appearance -- carrying out -- it carries out by [ as explaining below ]. First, as shown in drawing 7, the temporary set of the manuscript base glass 30 with which the height adjustment device 31 was attached is carried out on the top face of the body frame 1 of equipment. Next, L typeface member 45 for manuscript base glass positioning is fixed to the top face of the body frame 1 of equipment, L typeface member 45 is made to meet and the demerits side and the merits side of manuscript base glass 30 are positioned. And the height adjustment fixture 46 shown in drawing 8 is fixed to the top face of the body frame 1 of equipment. This height adjustment fixture 46 has the spherical projected part 47. The design fabrication of this height adjustment fixture 46 is carried out so that height h from that soffit to the top-most vertices of the spherical projected part 47 may satisfy the value-of-standard median of conjugation length. Where the nut 44 of the height adjustment device 31 is loosened, three height adjustment bolts 41 are adjusted and body side 30a of manuscript base glass 30 is contacted to the spherical projected part 47. The height adjustment device 31 which exists near the height adjustment fixture 46 performs height adjustment previously in that case. That is, a tool is inserted in the gap between the body frame 1 of equipment, and manuscript base glass 30, the height adjustment bolt 41 is rotated, and body side 30b of manuscript base glass 30 is contacted to the spherical projected part 47. next, parallel \*\*\*\* is performed, the remaining height adjustment device 31 performing height adjustment, doing the reverse resolution decipherment activity (focus appearance is carried out and it works) mentioned already. In addition, on the other hand, since it has become settled, if the screw pitch of the height adjustment bolt 41 what rotates the height adjustment bolt 41, it turns out whether it is the minimum value of standard of conjugation length, and the setting out is easy for it, since the design fabrication of the height adjustment fixture 46 is carried out so that the height from the soffit to the top-most vertices of the spherical projected part 47 may satisfy the value-of-standard median of conjugation length.

[0017] parallel appearance is carried out and the height adjustment bolt 41 is fixed with a nut 44 after termination. Moreover, it takes out in height and the adjustment fixture 46 is removed from the top face of the body frame 1 of equipment. Next, the height adjustment ring 48 is set to the top face of the body

frame 1 of equipment, and the manuscript base glass-stop member 49 and the height adjustment ring 48 are concluded on the body frame 1 of equipment using a screw 50. Manuscript base glass 30 is fixed to the body frame 1 of equipment by the manuscript base glass-stop member 49.

[0018] Drawing 9 shows the modification of the height adjustment device 31 concerning this invention, forms the breakthrough 51 of a minor diameter which leads to a holddown member 32 in a hollow 36, and it is taken as the configuration which \*\*\*\* to a holddown member 32, making the height adjustment bolt 41 screw in the insertion screw 39. In this modification, the spherical section 52 is formed at the head of that screw section 43 at the height adjustment bolt 41. Insertion screwing of the height adjustment bolt 41 is carried out from an upside at the insertion screw 39, and a nut 44 is arranged in the part of the screw section 43 between a head 42 and the male screw section 34 of a holddown member 32. According to this height adjustment device 31, height adjustment and parallel \*\*\*\* can be performed from the manuscript base glass 30 upside.

[0019] Drawing 10 shows the modification of the manuscript base glass 30 concerning this invention, and forms the destaticization film 53 in body side 30a of manuscript base glass 30. This destaticization film 30 consists of ITO film which is the compound of Indium In and Titanium Ti, and has the thickness of 1 micrometer or less. The destaticization film 53 may be formed all over manuscript base glass 30, as shown in drawing 11. In the case of this modification, the sleeve 33 and packing material 38 which constitute a part of height adjustment device 31 shown in drawing 6 and drawing 9 carry out impregnation of the conductive ingredient for example, into rubber, and conductivity is given.

Moreover, although it is desirable that it is a charge of metal lumber as for a holddown member 32, the insertion screw 39, and the height adjustment bolt 41, if it has conductivity, it will not be restricted to the charge of metal lumber. Since according to this modification static electricity can be certainly passed on the body frame 1 of equipment by the manuscript automatic transferring machine which omits a graphic display via a sleeve 33, a holddown member 32, a packing material 38, the insertion screw 39, and the height adjustment bolt 41 even when manuscript base glass 30 is electrified, static electricity generated on manuscript base glass 30 can be discharged certainly. In addition, the configuration which can remove static electricity through at least one of three height adjustment devices 31, the configuration which can remove static electricity through all the height adjustment devices 31 although it is sufficient, then clearance of one layer static electricity of twists become certain.

[0020]

[Effect of the Invention] since the manuscript reader of the electronic copying machine of this invention according to claim 1 was constituted as explained above, manuscript base glass can carry out parallel appearance of it, and it can carry out height appearance, and can perform adjustment with a sufficient precision easily and promptly. Moreover, since it is not necessary to specify the precision of the body frame 1 of equipment strictly compared with the former, the cost cut of the part can be aimed at. In addition, also when the thickness of the raw material of manuscript base glass is changed, the addition like a design change and an erector becomes unnecessary. And since it can take out in the height of manuscript base glass according to a height adjustment device and parallel \*\*\*\* can be performed to a precision, improvement in image quality is also expectable.

[0021] Since the manuscript reader of the electronic copying machine of this invention according to claim 2 was made to infix the sleeve which has elasticity in the breakthrough prepared in the manuscript base, and to support according to a height adjustment device through this sleeve, when an impact joins manuscript base glass, it can ease the concentrated load added near the breakthrough, and can prevent the crack by the impact of manuscript base glass.

[0022] Since the manuscript reader of the electronic copying machine of this invention according to claim 3 is taken out in the height to the light-receiving side of the body side of manuscript base glass and was made to perform height adjustment of manuscript base glass using the fixture member, management of conjugation length is easy for it, and it can perform height \*\*\*\* and parallel \*\*\*\*\* still more nearly promptly and easily.

[0023] Since it decided for claim 4 of this invention thru/or the manuscript reader of an electronic copying machine according to claim 6 to miss static electricity which formed the destaticization film at

least in one side of both sides of manuscript base glass, and was charged on manuscript base glass on the body frame of equipment via the height adjustment bolt screwed in the insertion fixed screw and the insertion fixed screw, static electricity can be certainly dropped on a ground, without deteriorating with time.

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[Translation done.]

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## DESCRIPTION OF DRAWINGS

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**[Brief Description of the Drawings]**

[Drawing 1] It is the schematic diagram of a conventional electronic analog-type copying machine.

[Drawing 2] It is the explanatory view of the conjugation relation between manuscript base glass and the light-receiving side of a photo conductor.

[Drawing 3] It is the schematic diagram of a conventional electronic digital-type copying machine.

[Drawing 4] It is the fragmentary sectional view showing the conventional example of immobilization on the frame of manuscript base glass.

[Drawing 5] It is the perspective view of the manuscript base glass concerning this invention.

[Drawing 6] It is the fragmentary sectional view showing an example of the height adjustment device concerning this invention.

[Drawing 7] It is the partial side elevation showing immobilization on the frame of manuscript base glass using the height adjustment device concerning this invention.

[Drawing 8] It is the partial side elevation showing an example of the height adjustment fixture concerning this invention.

[Drawing 9] It is the fragmentary sectional view showing the modification of the height adjustment fixture concerning this invention.

[Drawing 10] It is the sectional view showing the example of a complete-change form of the manuscript base glass concerning this invention.

[Drawing 11] It is the sectional view showing other modifications of the manuscript base glass concerning this invention.

**[Description of Notations]**

1 -- Body frame of equipment

30 -- Manuscript base glass

31 -- Height adjustment device

41 -- Insertion screw (insertion fixed screw)

30a -- Breakthrough

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[Translation done.]

**\* NOTICES \***

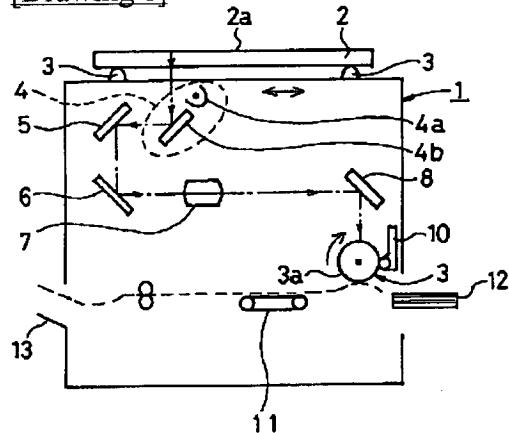
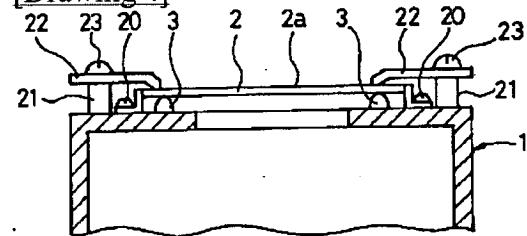
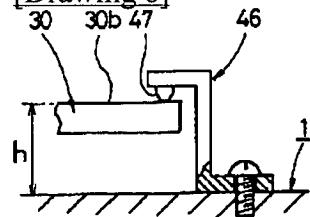
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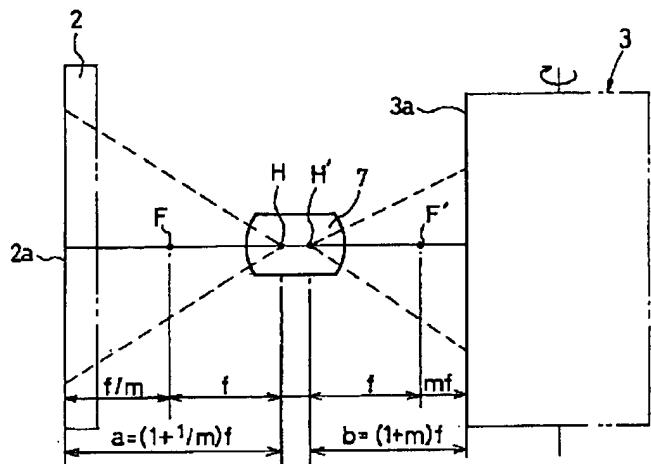
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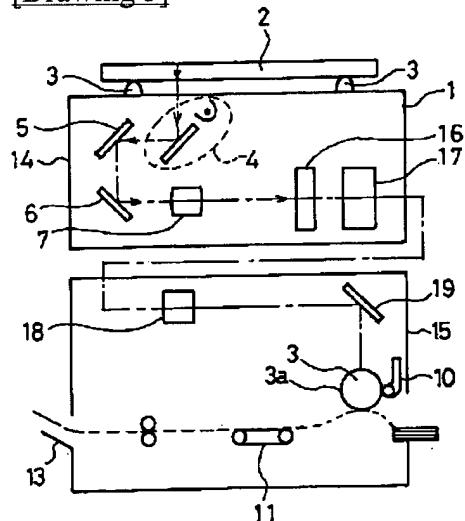
**DRAWINGS**

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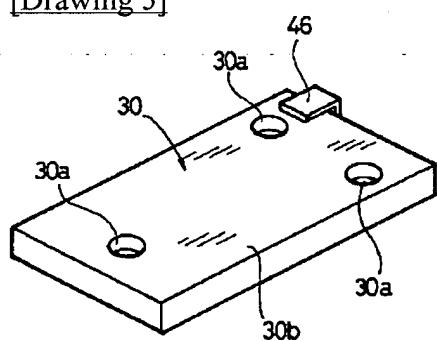
**[Drawing 1]****[Drawing 4]****[Drawing 8]****[Drawing 2]**



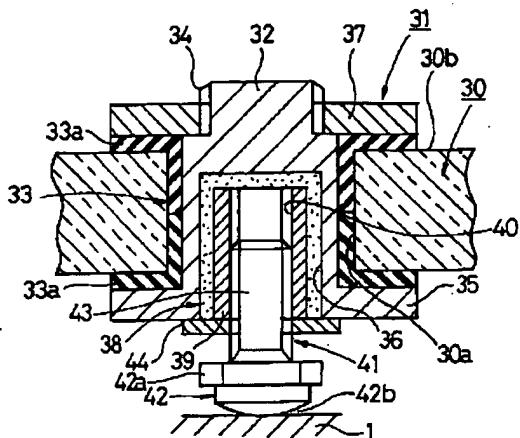
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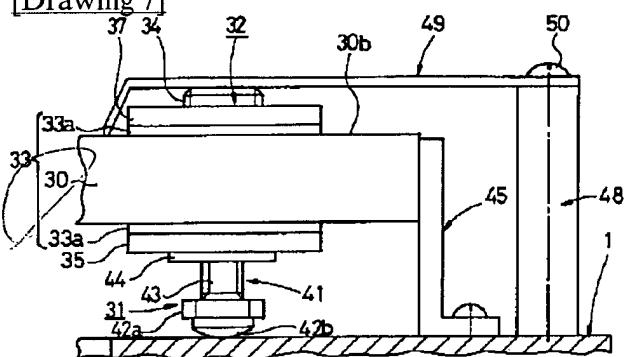
[Drawing 5]



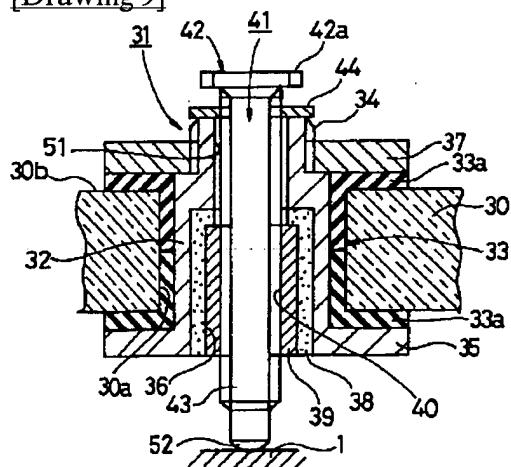
[Drawing 6]



[Drawing 7]



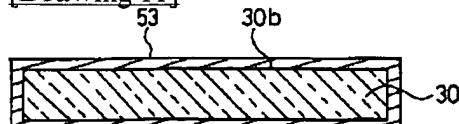
[Drawing 9]



[Drawing 10]



[Drawing 11]



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[Translation done.]

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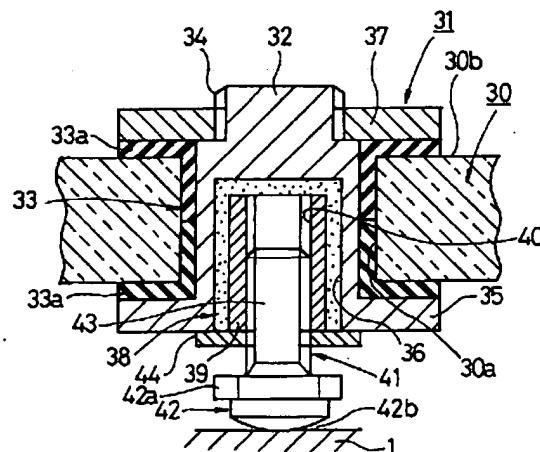
(74)代理人 弁理士 西脇 民雄

(54)【発明の名称】電子複写機の原稿読み取り装置

(57)【要約】

【課題】原稿台ガラスの平行出し及び高さ出し調整を容易に行うことができる電子複写機の原稿読み取り装置を提供する。

【解決手段】本発明の電子複写機の原稿読み取り装置は、装置本体フレーム1に対する高さ調整機構31が設けられ、原稿台ガラス30には貫通孔30aが形成され、高さ調整機構31は、貫通孔30aに挿入固定された挿入固定ネジ39と挿入固定ネジ39に螺合された高さ調整ボルト41により構成されている。



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## 【特許請求の範囲】

【請求項1】 装置本体フレームに固定される原稿台ガラスの前記装置本体フレームに対する高さ調整機構が設けられ、前記原稿台ガラスには貫通孔が形成され、前記高さ調整機構は、前記貫通孔に挿入固定された挿入固定ネジと該挿入固定ネジに螺合された高さ調整ボルトにより構成されている電子複写機の原稿読み取り装置。

【請求項2】 前記貫通孔に弹性を有するスリーブが介装され、該スリーブはその両端に前記原稿台ガラスの両面に接触する環状鍔を有し、前記挿入固定ネジが前記鍔付きスリーブに固定されている請求項1に記載の電子複写機の原稿読み取り装置。

【請求項3】 前記装置本体フレームに、前記原稿台ガラスの物体面の受光面に対する位置出し用の原稿台ガラス高さ出し治具部材が該原稿台ガラスの側縁に臨んで設けられている請求項1に記載の電子複写機の原稿読み取り装置。

【請求項4】 前記原稿台ガラスの両面の少なくとも一方に静電気除去膜が形成され、前記原稿台ガラスに帶電した静電気が前記挿入固定ネジと該挿入固定ネジに螺合された高さ調整ボルトを経由して前記装置本体フレームに除去されることを特徴とする請求項1に記載の電子複写機の原稿読み取り装置。

【請求項5】 前記貫通孔に弹性を有するスリーブが介装され、前記挿入固定ネジは充填剤を介して前記貫通孔に固定され、前記スリーブ及び前記充填剤が導電性である請求項1に記載の電子複写機の原稿読み取り装置。

【請求項6】 前記電気複写機が原稿を前記原稿台ガラスに向けて自動給送する自動給送タイプのものである請求項1に記載の電子複写機の原稿読み取り装置。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】本発明は、電子複写機の原稿読み取り装置の改良に関するものである。

## 【0002】

【従来の技術】従来から、電子複写機には、アナログ式のものと、デジタル式のものとがあり、アナログ式のものには、図1に模式的に示すように、装置本体フレーム1の上部に原稿台ガラス2が設けられている。原稿台ガラス2は装置本体フレーム1に一体に突設された球状突起部3に支持されている。その球状突起部3は原稿台ガラス2の物体面2aと後述する感光体回転ドラム3の受光面との平行出し及び高さ出しの役割を果たす。装置本体フレーム1の内部には、光学スキャナー4、ミラー5、6、レンズ7、ミラー8、感光体回転ドラム3、帶電・現像ユニット10、定着装置11等が設けられ、装置本体フレーム1の一側部でその下部には給紙カセット12が設けられ、装置本体フレーム1の他側部でその下部には排出部13が設けられている。光学スキャナー4はランプ4aとミラー4bとから構成され、その光学ス

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キャナー4は矢印方向に走査され、これにより原稿台ガラス2がスリット露光され、原稿台ガラス2にセットされた原稿(図示を略す)から反射された反射光がミラー4b、5、6、レンズ7、ミラー8により感光体回転ドラム3の受光面3aに導かれ、感光体回転ドラム3の受光面3aに静電潜像が形成される。

【0003】その感光体回転ドラム3の受光面3aに形成された静電潜像は、帶電・現像ユニット10によってトナー像として可視像化され、一方、給紙カセット12から所定のタイミングで複写用紙が搬送され、その複写用紙に感光体回転ドラム3に形成されたトナー像が転写され、定着装置11によって定着され、排出部13から原稿の画像情報が複写された複写用紙が排出される。

【0004】図2はその原稿台ガラス2の物体面2aとレンズ7と感光体ドラム9の受光面3aとの光学的位置関係を示す模式図である。レンズ7の焦点距離をf、倍率mで受光面3aに結像させることにするには、レンズ7の主点Hから物体面2aまでの距離aが(1)式を満足し、レンズ7の主点H'から受光面3aまでの距離bが(2)式を満足するように、レンズ7を配設すれば良い。

$$a = (1 + 1/m) f \quad \dots (1)$$

$$b = (1 + m) f \quad \dots (2)$$

なお、図2において、符号F、F'は主点H、H'からの焦点位置を示す。

【0005】その物体面2aから受光面3aまでの距離は共役長と言われ、共役長と倍率を維持し、物体面2aのスリット露光によるライン情報を受光面3aに平行に伝搬させるために、受光面3aに基準チャートを配設し、物体面2aにレンズ7を介して基準チャートの像を投影し、物体面2aで基準チャートの像を判読するという逆解像力判読作業(ピント出し作業)を行っており、物体面2aのライン情報が受光面3aに平行に伝搬されて結像されずかつそのライン情報と直交する走査方向の情報が同一光学距離を保って結像されないときには、原稿台ガラス2の物体面2aと受光面3aとが平行でかつ共役長が光学設計値の範囲内となるように、各ミラー5、6、8の傾斜調整、レンズ7の位置調整を行っている。なお、複写機に変倍機能を与える場合には、レンズ7を投影光路に沿って僅かに移動せたり、各ミラー5、6、8を投影光路に沿って移動せたりしている。また、原稿台ガラス2の厚さの変更がある場合には、この共役長の調整が必要となる。

【0006】デジタル式の電子複写機は、図3に示すようにリーダー部14とプリンター部15とから大略構成されている。リーダー部14にはアナログ式のものと同様に、原稿台ガラス2、球状突起部3、光学スキャナー4、ミラー5、6、レンズ7が設けられ、原稿台ガラス2にセットされた原稿の画像情報は、光学スキャナー4、ミラー5、6、レンズ7により受光面としてのCC

D16に結像されて、光電変換信号に変換され、画像処理部17により処理される。プリンター部15には書込み光学系18、アナログ式のものと同様のミラー19、感光体回転ドラム3、帶電・現像ユニット10、定着装置11等が設けられ、書込み光学系18は画像処理部17の処理情報に従って感光体回転ドラム3の受光面3aに画像情報が書き込まれる。その感光体回転ドラム3の受光面3aに書き込まれた画像情報は、複写用紙に複写されて、排出部13から原稿の画像情報が複写された複写用紙が排出される。

【0007】装置本体フレーム1の上部には、図4に詳細に示すように、原稿台ガラス2を位置決めするためのL字形部材19が締結部材20によって固定され、原稿台ガラス2を球状突起部3に載置し、高さ調整リング21と原稿台ガラス押さえ部材22とを装置本体フレーム1に配設し、締結部材23を用いて高さ調整リング21と原稿台ガラス押さえ部材22とを装置本体フレーム1に固定することにより、原稿台ガラス2が装置本体フレーム1の上面に固定される。

#### 【0008】

【発明が解決しようとする課題】しかしながら、従来の電子式の複写機は、原稿台ガラス2の高さ出しと平行出しとを精密に設定するために、球状突起部3を精度高く作成しなければならず、しかも、原稿台ガラス2の高さ出しと平行出しとの調整作業を、ミラー5、6、8の傾斜調整、レンズ7の位置調整により行っていたので、調整作業に時間がかかり、コストが高くなるという問題点がある。また、原稿台ガラス2の厚さが変更されることがあり、とりわけ、原稿台ガラス2は概して薄型化される傾向にあり、この場合には、原稿台ガラス2と球状突起部3との間にスペーサーを挿入して高さ調整を行わなければならず、組立工程の追加変更等によりコストが増加する。加えて、原稿台ガラス2には球状突起部3との接触部に支持されているため、原稿台ガラス2に衝撃力が加わると、その接触部に集中荷重が加わり、原稿台ガラス2が割れる可能性が大きい。

【0009】なお、電子複写機の原稿読み取り装置で、原稿台ガラス2が摺動式のものには、原稿台ガラス2そのものの高さを調整するようにしたものが知られているが（実開昭63-334号公報参照）、このものでは、原稿台ガラス2の全面の高さ出しと平行出しとを行うことが難しい。

【0010】次に、電子複写機には、原稿を原稿台ガラスに向けて自動給送する原稿自動給送装置を備えているものがあるが、このものでは、原稿が原稿台ガラスを摺動するときに発生する静電気を除去するために、原稿台ガラス2の各辺にメッキ、蒸着等の手段により導電物質の膜を形成するか、あるいは、その各辺に金属プレートを貼り付け、原稿台ガラス2に発生した静電気をアース線を通して除電するようにしている（実開昭60-19

1042号公報参照）。しかし、このアース線を接着剤、テーピング、はんだ付け等により装置本体フレームに固定することとすると、電子複写機の作動時の機械的振動により剥がれ、機械的衝撃による剥離、経年変化による浮きが発生するおそれがある。また、この原稿台ガラス2に発生した静電気を除去するために、原稿台ガラス2の表面に透明導電膜を形成し、この透明導電膜に導電性クッション部材を接触させ、導電性部材、アース線を通して除電する構成のものもあるが（特開昭62-182735号公報参照）、このものも実開昭60-191042号公報と同様に電子複写機の作動時の機械的振動により剥がれ、機械的衝撃による剥離、経年変化による浮きが発生するおそれがある。更に、この原稿台ガラス2に発生した静電気を除去するために、原稿台ガラス2に透明導電膜を形成し、原稿台ガラス2の側端面に導電性部材を押し付けてアースする構成のものも知られているが（実開昭62-164339号公報参照）、このものにも電子複写機の作動時の機械的振動により剥がれ、機械的衝撃による剥離、経年変化による浮きが発生するおそれがある。

【0011】本発明は、上記の事情に鑑みて為されたもので、その第1の目的は、原稿台ガラスの平行出し及び高さ出し調整を容易に行うことができる電子複写機の原稿読み取り装置を提供する。その第2の目的は、その原稿台ガラスの平行出し及び高さ出し調整の機構を用いて原稿台ガラスに発生した静電気を確実に除電することができる電子複写機の原稿読み取り装置を提供する。

#### 【0012】

【課題を解決するための手段】本発明の請求項1に記載の電子複写機の原稿読み取り装置は、装置本体フレームに固定される原稿台ガラスの前記装置本体フレームに対する高さ調整機構が設けられ、前記原稿台ガラスには貫通孔が形成され、前記高さ調整機構は、前記貫通孔に挿入固定された挿入固定ネジと該挿入固定ネジに螺合された高さ調整ボルトにより構成されている。本発明の請求項2に記載の電子複写機の原稿読み取り装置は、請求項1に記載のものにおいて、前記貫通孔に弾性を有するスリーブが介装され、該スリーブはその両端に前記原稿台ガラスの両面に接触する環状鍔を有し、前記挿入固定ネジが前記鍔付きスリーブに固定されている。本発明の請求項3に記載の電子複写機の原稿読み取り装置は、請求項1に記載のものにおいて、前記装置本体フレームに、前記原稿台ガラスの物体面の受光面に対する位置出し用の原稿台ガラス高さ出し治具部材が該原稿台ガラスの側縁に臨んで設けられる。本発明の請求項4に記載の電子複写機の原稿読み取り装置は、請求項1に記載のものにおいて、前記原稿台ガラスの両面の少なくとも一方に静電気除去膜が形成され、前記原稿台ガラスに帯電した静電気が前記挿入固定ネジと該挿入固定ネジに螺合された高さ調整ボルトを経由して前記装置本体フレームに除去される。

本発明の請求項5に記載の電子複写機の原稿読み取り装置は、請求項1に記載のものにおいて、前記貫通孔に弾性を有するスリーブが介装され、前記挿入固定ネジは充填剤を介して前記貫通孔に固定され、前記スリーブ及び前記充填剤が導電性である。本発明の請求項6に記載の電子複写機の原稿読み取り装置は、請求項1に記載のものにおいて、前記電気複写機が原稿を前記原稿台ガラスに向けて自動給送する自動給送タイプのものである。

## 【0013】

【発明の実施の形態】以下に、本発明に係わる電子複写機の原稿読み取り装置の実施の形態を図面を参照しつつ説明する。図5は本発明に係わる原稿台ガラス30の斜視図を示し、この原稿台ガラス30は3個の貫通孔30aを有し、そのうちの2個の貫通孔30a、30aはその原稿台ガラス30の一方の短辺部の隅部に配設され、他の1個の貫通孔30aは他方の短辺部の中央に配設されている。その貫通孔30aには、図6に示すように、高さ調整機構31が設けられている。

【0014】この高さ調整機構31は固定部材32を有する。この固定部材32はゴム製材料からなるスリーブ33を介して貫通孔30aに挿入されている。このスリーブ33は上下分割構成とされ、スリーブ33の頭部には鈎部33aが形成されている。固定部材32の頂部には雄ネジ部34が形成され、固定部材32の下部には鈎部35が形成されている。固定部材32には凹所36が形成されている。その固定部材32はナット37を雄ネジ部34に螺合させることにより原稿台ガラス30に固定される。スリーブ33は、そのナット37と鈎部35により原稿台ガラス30に固定される。

【0015】固定部材32の凹所36にはゴム性の充填材料38が配設され、このゴム性の充填材料38により挿入固定ネジとしてのインサートネジ39が凹所36に固定されている。インサートネジ39には雌ネジ40が設けられ、このインサートネジ39には高さ調整ボルト41が螺合されている。その高さ調整ボルト41の頭部42には六角形状の工具係合部42aと球状部42bとが設けられている。その高さ調整ボルト41のネジ部43にはナット44が螺合されている。

【0016】その高さ調整ボルト41の球状部42bは装置本体フレーム1の上面に接触されている。高さ調整機構31を用いて原稿台ガラス30の高さ出し及び平行出しは、以下に説明するようにして行う。まず、高さ調整機構31が組み付けられた原稿台ガラス30を図7に示すように、装置本体フレーム1の上面に仮セットする。次に、原稿台ガラス位置決め用のL字形部材45を装置本体フレーム1の上面に固定し、原稿台ガラス30の一短辺と一長辺とをL字形部材45に沿わせて位置決めする。そして、装置本体フレーム1の上面に図8に示す高さ調整治具46を固定する。この高さ調整治具46はその球状突部47を有する。この高さ調整治具46はその

下端から球状突部47の頂点までの高さが共役長の規格値中央値を満足するように設計製作されている。高さ調整機構31のナット44を緩めた状態で、3個の高さ調整ボルト41を調整し、原稿台ガラス30の物体面30aを球状突部47に接触させる。その際、高さ調整治具46の近傍に存在する高さ調整機構31により高さ調整を先に行う。すなわち、装置本体フレーム1と原稿台ガラス30との間の隙間に工具を挿入して、高さ調整ボルト41を回転させ、原稿台ガラス30の物体面30bを球状突部47に接触させる。次に、既述した逆解像力判読作業（ピント出し作業）を行いつつ、残りの高さ調整機構31により高さ調整を行いつつ平行出しを行う。なお、高さ調整治具46は、その下端から球状突部47の頂点までの高さが共役長の規格値中央値を満足するよう設計製作されているので、一方、高さ調整ボルト41のネジピッチは定まっているので、高さ調整ボルト41を何回転させると、共役長の下限規格値であるかがわかり、その設定が容易である。

【0017】平行出し終了後、ナット44により高さ調整ボルト41を固定する。また、高さ出し調整治具46を装置本体フレーム1の上面から取り外す。次に、高さ調整リング48を装置本体フレーム1の上面にセットし、原稿台ガラス押え部材49と高さ調整リング48とをビス50を用いて装置本体フレーム1に締結する。原稿台ガラス30はその原稿台ガラス押え部材49により装置本体フレーム1に固定される。

【0018】図9は本発明に係わる高さ調整機構31の変形例を示すもので、固定部材32に凹所36に通じる小径の貫通孔51を形成し、高さ調整ボルト41をインサートネジ39に螺合させつつ固定部材32に貫挿する構成としたものである。この変形例では、高さ調整ボルト41にはそのネジ部43の先端に球状部52が形成されている。高さ調整ボルト41は上側からインサートネジ39に挿通螺合され、ナット44は頭部42と固定部材32の雄ネジ部34との間のネジ部43の箇所に配設される。この高さ調整機構31によれば、原稿台ガラス30の上側から高さ調整、平行出しを行うことができる。

【0019】図10は本発明に係わる原稿台ガラス30の変形例を示すもので、原稿台ガラス30の物体面30aに静電気除去膜53を形成したものである。この静電気除去膜30はインジウムInとチタンTiの化合物であるITO膜からなり、1μm以下の厚さを有している。その静電気除去膜53は図11に示すように原稿台ガラス30の全面に形成しても良い。この変形例の場合、図6、図9に示す高さ調整機構31の一部を構成するスリーブ33、充填材料38は例えばゴム中に導電性材料を含浸させて導電性が付与されている。また、固定部材32、インサートネジ39、高さ調整ボルト41は金属製材料であることが望ましいが、導電性を有するも

のあれば金属製材料に限られるものではない。この変形例によれば、図示を略す原稿自動搬送装置により、原稿台ガラス30が静電気を帯びた場合でも、スリーブ33、固定部材32、充填材料38、インサートネジ39、高さ調整ボルト41を経由して装置本体フレーム1に確実に静電気を流すことができるので、原稿台ガラス30に発生した静電気を確実に除電することができる。なお、3個の高さ調整機構31の少なくとも1個を通して静電気を除去できる構成とすれば足りるが、全ての高さ調整機構31を通して静電気を除去できる構成とすれば、より一層静電気の除去が確実となる。

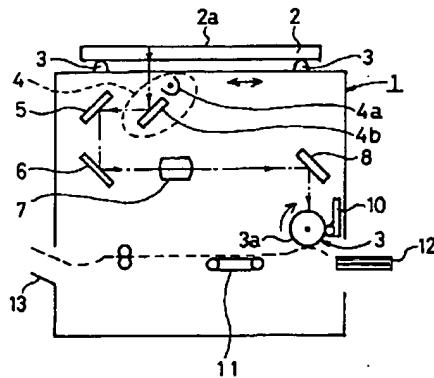
## 【0020】

【発明の効果】本発明の請求項1に記載の電子複写機の原稿読み取り装置は、以上説明したように構成したので、原稿台ガラスの平行出し及び高さ出し調整を精度良くかつ容易にしかも迅速に行うことができる。また、従来に較べて装置本体フレーム1の精度を厳格に規定しなくとも良いので、その分のコストダウンを図ることができる。加えて、原稿台ガラスの素材の厚さを変更した場合にも、設計変更、組立工程の追加が不要となる。しかも、高さ調整機構により原稿台ガラスの高さ出し、平行出しを精密に行うことができるので、画像品質の向上も期待できる。

【0021】本発明の請求項2に記載の電子複写機の原稿読み取り装置は、原稿台に設けた貫通孔に弹性を有するスリーブを介装し、このスリーブを介して高さ調整機構により支持することにしたので、原稿台ガラスに衝撃が加わった場合に貫通孔近傍に加わる集中荷重を緩和することができ、原稿台ガラスの衝撃による割れを防止できる。

【0022】本発明の請求項3に記載の電子複写機の原稿読み取り装置は、原稿台ガラスの物体面の受光面に対する高さ出し治具部材を用いて原稿台ガラスの高さ調整を行うようにしたので、共役長の管理が容易であり、より一層迅速にかつ容易に高さ出しと平行出しとを行うことができる。

【図1】



【0023】本発明の請求項4ないし請求項6に記載の電子複写機の原稿読み取り装置は、原稿台ガラスの両面の少なくとも一方に静電気除去膜を形成し、原稿台ガラスに帶電した静電気を挿入固定ネジと挿入固定ネジに螺合された高さ調整ボルトを経由して装置本体フレームに逃がすこととしたので、経時的に劣化することなく静電気を確実にアースに落とすことができる。

## 【図面の簡単な説明】

【図1】 従来のアナログ式の電子複写機の概要図である。

【図2】 原稿台ガラスと感光体の受光面との共役関係の説明図である。

【図3】 従来のデジタル式の電子複写機の概要図である。

【図4】 原稿台ガラスのフレームへの固定の従来例を示す部分断面図である。

【図5】 本発明に係わる原稿台ガラスの斜視図である。

【図6】 本発明に係わる高さ調整機構の一例を示す部分断面図である。

【図7】 本発明に係わる高さ調整機構を用いて原稿台ガラスのフレームへの固定を示す部分側面図である。

【図8】 本発明に係わる高さ調整治具の一例を示す部分側面図である。

【図9】 本発明に係わる高さ調整治具の変形例を示す部分断面図である。

【図10】 本発明に係わる原稿台ガラスの一変形例を示す断面図である。

【図11】 本発明に係わる原稿台ガラスの他の変形例を示す断面図である。

## 【符号の説明】

1…装置本体フレーム

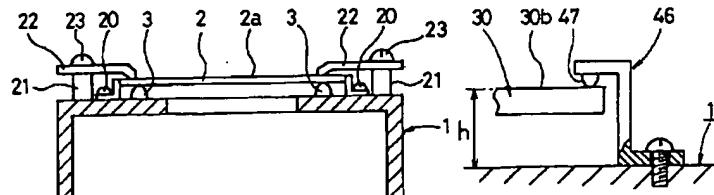
30…原稿台ガラス

31…高さ調整機構

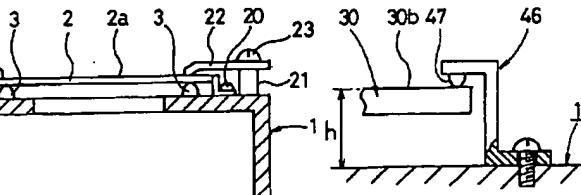
41…インサートネジ（挿入固定ネジ）

30a…貫通孔

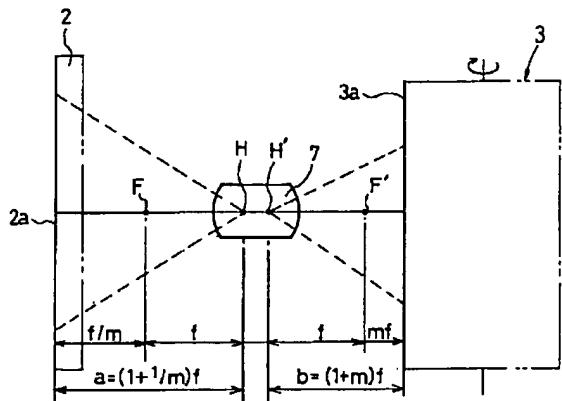
【図4】



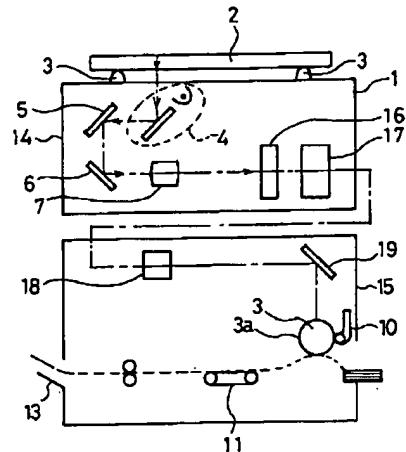
【図8】



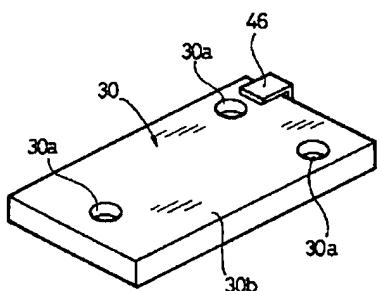
【図2】



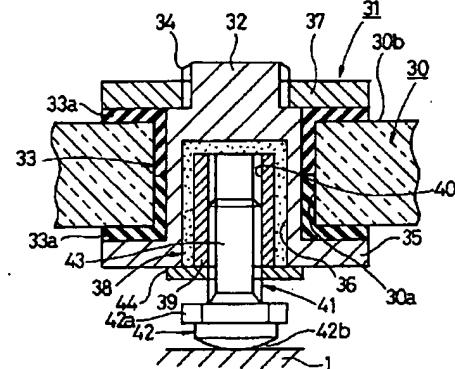
【図3】



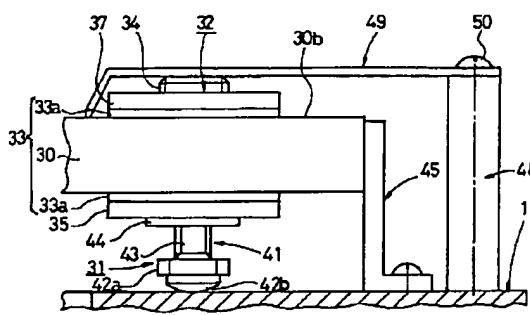
【図5】



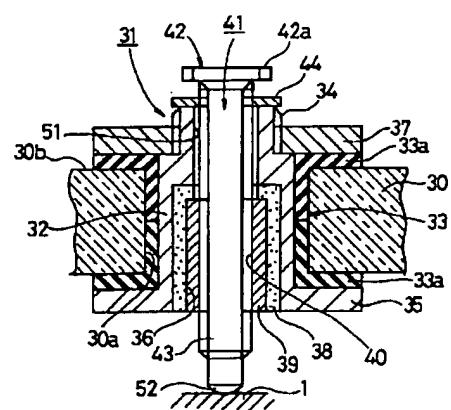
【図6】



【図7】



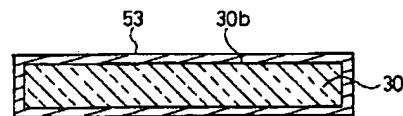
【図9】



【図10】



【図11】



PAT-NO: JP410285336A  
DOCUMENT-IDENTIFIER: JP 10285336 A  
TITLE: ORIGINAL READER FOR ELECTRONIC COPYING MACHINE  
PUBN-DATE: October 23, 1998

INVENTOR-INFORMATION:

NAME  
KATOGI, TSUTOMU

INT-CL (IPC): H04N001/04, G03G015/00

ABSTRACT:

PROBLEM TO BE SOLVED: To provide an original reader for an electronic copying machine, in which parallel and height alignment of an original platen glass is easily conducted.

SOLUTION: This original reader is provided with a height adjustment device 31 for adjusting the height of an original platen glass 30 fixed to a device main body frame 1, with respect to the device main body frame 1, a through-hole 30a is formed on the original platen glass 30, the height adjustment device 31 is made up of an insert fix thread 39 inserted and fixed to the through-hole 30a and a height adjustment bolt 41 screed to the insertion fixed thread 39.

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Abstract Text - FPAR (2):

SOLUTION: This original reader is provided with a height adjustment device 31 for adjusting the height of an original platen glass 30 fixed to a device main body frame 1, with respect to the device main body frame 1, a

through-hole 30a is formed on the original platen glass 30, the height adjustment device 31 is made up of an insert fix thread 39 inserted and fixed to the through-hole 30a and a height adjustment bolt 41 screed to the insertion fixed thread 39.